

## TWO NEW NEMATODES OF THE FAMILY STRONGYLIDAE, PARASITIC IN THE INTESTINES OF MAMMALS

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The first parasite described in this paper was collected by Dr. E. W. Price, of the Bureau of Animal Industry, in the course of a post-mortem examination of a wart hog (*Phacochoerus aethiopicus massaicus*) which was received at the National Zoological Park, Washington, D. C., on October 26, 1926, and which died June 6, 1927. The worms, which represent a new genus and species, were found in the large intestine in association with three species of the nematode genus *Oesophagostomum* as follows: *O. mwanzae*, *O. eurycephalum*, and *O. yorkei*.

### PHACOCHOEROSTRONGYLUS, new genus

STRONGYLIDAE.—The mouth is directed straight forward. There are four submedian and two lateral cephalic papillae. An external and an internal leaf crown are present. The buccal capsule is rather shallow and cylindrical in shape. The esophagus is club-shaped. Male bursa with two lateral lobes and a well-developed dorsal lobe. Ventro-ventral and latero-ventral rays short, parallel, and close together; externo-lateral, medio-lateral, and postero-lateral rays originate from a common trunk, the last two being parallel and close together, the externo-lateral ray diverging from them. Externodorsal and dorsal rays arise from a common trunk. Dorsal ray with a pair of branches anterior to its cleft. Each of the terminal branches of the dorsal ray with one small or rudimentary accessory branch. Spicules slender, filiform, and sheathed. Gubernaculum present. Vulva and anus very close together. The terminal portion of the female bent dorsad. Vagina relatively long, communicating on each side with an ovejector, the ovejectors and uteri being parallel.

### PHACOCHOEROSTRONGYLUS PRICEI, new species

The head (fig. 1) is separated from the rest of the body by a well defined transverse constriction. The buccal capsule is supported by chitinous walls whose appearance in optical section is shown in Figure 1. The external leaf crown consists of 10 elements which are long and pointed; the internal leaf crown consists of about 24

small elements. The first part of the esophagus consists of a broad anterior portion and a narrow posterior portion the latter gradually widening out to form the posterior part of the esophagus. The nerve ring is located approximately at the beginning of the second third of the esophagus in the region of the constricted portion of that organ. The cervical papillae are located slightly posterior to the middle of the esophagus. The lining of the walls of the esophageal funnel is modified to form six toothlike structures, triangular in shape with apex directed forwards.

*Male.*—The male is from about 8.5 to 10 mm. long by from 370 to slightly over  $400\mu$  in maximum width and from about  $185\mu$  to  $200\mu$  wide just anterior to the bursa, in the region of the pre-bursal papillae. The head is from  $117\mu$  to  $125\mu$  in maximum diameter. The maximum width of the buccal capsule is about  $100\mu$ . The esophagus is from  $756\mu$  to  $840\mu$  long by  $202\mu$  in maximum width and  $84\mu$  in minimum width. The nerve ring is located at a distance of about  $270\mu$  from the anterior extremity of the esophagus, and the cervical papillae are located approximately in the middle region of the esophagus. The ventro-ventral and latero-ventral rays (fig. 6) have a horizontal direction and extend to the margin of the lateral lobes of the bursa. The medio-lateral and postero-lateral rays extend close to the margin of the bursa, whereas the externo-lateral ray which diverges from the former terminates at some distance from the margin of the bursa. The externo-dorsal ray arises at a distance of from  $220\mu$  to  $250\mu$  from the tips of the terminal branches of the dorsal ray. The undivided portion of the dorsal ray has a pair of accessory branches located at a distance of about  $50\mu$  from the point at which this ray becomes cleft; the accessory branches arise symmetrically (fig. 2) or asymmetrically (fig. 5) from the stem of the dorsal ray which is cleft on its posterior third, the diverging terminal branches being about  $85\mu$  long. Each terminal branch of the dorsal ray has a small accessory branch which may be rudimentary (fig. 5) and is located at a distance of about  $33\mu$  from the tip. The spicules (fig. 3) are slender, alate, from  $672\mu$  to  $840\mu$  long, and terminate in knoblike tips. The gubernaculum is more or less pear-shaped, from  $63\mu$  to  $67\mu$  long by about  $21\mu$  in maximum width.

*Female.*—The female is from 9 to 9.5 mm. long by  $470\mu$  to  $487\mu$  wide. The maximum diameter of the head is  $134\mu$ . Diameter of buccal capsule same as in male. The esophagus is from about  $873\mu$  to  $923\mu$  long by  $235\mu$  to  $319\mu$  in maximum width. In one specimen the nerve ring is located at a distance of about  $285\mu$  from the anterior extremity of the esophagus, being somewhat posterior to the beginning of the second third of that organ. In the same specimen the cervical papillae are located at a distance of  $436\mu$  from the anterior

end of the esophagus which is slightly posterior to the middle of that organ. The distance between the vulva and anus (fig. 7) is  $67\mu$ . The vagina is about  $350\mu$  long and each ovejector is about  $285\mu$  long or somewhat longer. The tail is  $84\mu$  long and terminates bluntly. The posterior end of the female is turned dorsad and has the appearance of a foot (fig. 4) when the worm is viewed from the side.

*Host*.—*Phacochoerus aethiopicus massaicus*.

*Location*.—Large intestine.

*Locality*.—National Zoological Park, Washington, D. C.

*Type specimen*.—No. 27789. U.S.N.M.

*Paratypes*.—No. 27790. U.S.N.M.

This species is named after Dr. E. W. Price who collected the nematode specimens from the wart hog and kindly turned them over to the writer for determination.

The second lot of specimens, which also represent a new genus and species, were collected by Dr. L. T. Giltner, of the Bureau of Animal Industry, from the intestine of a common wombat (*Phascalomys mitchelli*) about 10 years ago. The host animal in question was received at the National Zoological Park, Washington, D. C., on December 1, 1916, and died of pneumonia on July 8, 1917. Doctor Giltner made a post-mortem examination of the carcass and discovered a number of nematodes in the large intestine which he kindly turned over to the writer for determination. The illustrations accompanying the description of these worms (Plate 2) were made in July, 1917. Unfortunately most of the specimens were allowed to become dry at one time during the intervening period and it is therefore difficult to study the material at the present time in as great detail as is desirable. However, the salient characters of these nematodes indicate quite clearly that they represent a new genus and species.

#### OESOPHAGOSTOMOIDES, new genus

**STRONGYLIDAE**.—The mouth is directed straight forward. The mouth collar bears four prominent submedian and two lateral papillae. (Fig. 2.) The buccal capsule is of moderate depth and cylindrical in shape. (Fig. 5.) An external leaf crown is present; an internal leaf crown is absent. The esophagus is club-shaped. A ventral esophageal groove is absent. Male bursa with two lateral lobes and a well developed dorsal lobe. The ventro-ventral and latero-ventral rays are close together and parallel. The externo-lateral, medio-lateral and postero-lateral rays originate from a common trunk, the last two being close together and parallel the externo-lateral ray being separated from them by a relatively wide groove. Externo-dorsal and dorsal rays arise from a common trunk, the latter being cleft approximately in the posterior half, each terminal branch



with an accessory branch. The spicules are equal and alate; a gubernaculum is present. The vulva and anus are fairly close. The vagina is relatively long and is connected with two parallel ovejectors. The uteri are parallel.

The genus *Oesophagostomoides* is related to the genus *Oesophagostomum*, differing primarily from the latter in two important characters as follows: (1) *Oesophagostomoides* lacks a ventral cervical groove, which is a primary diagnostic character of the genus *Oesophagostomum* and (2) the ovejector apparatus of *Oesophagostomoides*, which resembles that of the genus *Phacochoerstrongylus*, is a simpler structure than that of *Oesophagostomum*. In the latter each uterus opens posteriorly into an ovejector, the two ovejectors opening into a kidney shaped pars ejectrix which in turn communicates with the vagina. In the genus *Oesophagostomoides* the ovejector apparatus is relatively simple, the two ovejectors, which are continuous with the uteri, opening directly into the vagina.

The specific name *O. giltneri* is proposed for the species from *Phascolomys mitchelli* as an appreciation of Doctor Giltner's kindness in turning these specimens over to the writer for determination.

OE SOPHAGOSTOMOIDES GILTNERI, new species

The cuticle behind the mouth collar is slightly inflated. The buccal capsule is as deep as or somewhat deeper than broad and is supported by chitinous walls the appearance of which in optical section is shown in Figure 5. The external leaf crown contains 8 elements. (Fig. 2.) The nerve ring is located anterior to the middle of the esophagus, and the cervical papillae are located posterior to the nerve ring, their position being variable. In two well preserved specimens a definite constriction of the cuticle in the esophageal region was observed, the position of the cuticular constriction corresponding approximately to the beginning of the second fourth of the esophagus. Whether this constriction is also present in other specimens could not be definitely determined owing to the condition of the specimens, many of which have a wrinkled cuticle as a result of having become dry at one time.

*Male*.—The male is from 10 to 11 mm. long by about  $375\mu$  in maximum width. The diameter of the mouth collar is  $84\mu$ . The esophagus is from  $587\mu$  to slightly over  $630\mu$  long by about  $120\mu$  in maximum width. The nerve ring is located approximately at the beginning of the third fifth of the esophagus. In a specimen in which the esophagus is about  $630\mu$  long the nerve ring is located at a distance of  $264\mu$  from the beginning of the esophagus. All the rays of the bursa (figs. 3 and 4) are gradually attenuated and terminate in pointed tips. With the exception of the externo-lateral and the

externo-dorsal rays, all the rays reach the margin of the bursa. The dorsal ray is cleft anterior to its middle, the two terminal branches being about  $152\mu$  long. Each terminal branch gives off an accessory branch slightly posterior to its point of origin from the main stem of the dorsal ray. The spicules are slender, alate, about  $780\mu$  long. The gubernaculum is more or less pear-shaped.

*Female*.—The female is from 12 to 15 mm. long by about  $495\mu$  in maximum width, some specimens being more slender. The esophagus is from about  $620\mu$  to  $695\mu$  long by  $138\mu$  to  $144\mu$  in maximum width. The nerve ring is located approximately at the beginning of the fifth ninth of the oesophagus. The vulva (fig. 1) has prominent lips and is located at a distance of 190 to  $228\mu$  from the anus. The vagina is about  $230\mu$  long. The ovejectors are about  $265\mu$  long. The tail is from  $90\mu$  to  $105\mu$  long, its terminal portion being slender and blunt.

*Host*.—Common wombat (*Phascolomys mitchelli*).

*Location*.—Large intestine.

*Locality*.—National Zoological Park, Washington, D. C.

*Type specimens*.—No. 27198, U.S.N.M.

*Paratypes*.—No. 19180, U.S.N.M.

#### EXPLANATION OF PLATES

*a.*, anus; *c. p.* cervical papillae; *d.*, dorsal ray; *e. d.*, externo-dorsal ray; *e. l.*, externo-lateral ray; *g.*, gubernaculum; *int.*, intestine; *l. c.*, leaf crown element; *l. p.*, lateral-papilla; *l. v.*, latero-ventral ray; *m. l.*, medio-lateral ray; *n. r.* nerve ring; *oes.*, esophagus; *ovj.*, ovejector; *p. l.* postero-lateral ray; *sp.*, spicule; *s. p.*, submedian papilla; *t. d.*, terminal branch of dorsal ray, *ut.*, uterus; *vg.*, vagina; *v.* and *vl.*, vulva; *v. v.*, ventro-ventral ray.

#### PLATE 1

*Phacochoerostrongylus pricei*, new genus and species. Fig. 1, anterior portion of body; Fig. 2, externo-dorsal and dorsal ray; Fig. 3, posterior portion of male; Fig. 4, posterior portion of female (lateral view); Fig. 5, externo-dorsal and dorsal rays; Fig. 6, male bursa; Fig. 7, posterior portion of female.

#### PLATE 2

*Oesophagostomoides giltneri*, new genus and species. Fig. 1, posterior portion of female; Fig. 2, top view of head; Fig. 3, posterior portion of male (ventral view); Fig. 4, posterior portion of male (lateral view); Fig. 5, anterior portion of body.

